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Khoyi et al.

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## [54] DATA INTEGRATION BY OBJECT MANAGEMENT

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[\*] Notice: The term of this patent shall not extend beyond the expiration date of Pat. No. 5,206,951.

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## Related U.S. Application Data

[63] Continuation of Ser. No. 66,688, May 20, 1993, Pat. No. 5,421,012, which is a continuation of Ser. No. 938,928, Aug. 31, 1992, Pat. No. 5,226,161, which is a continuation of Ser. No. 681,435, Apr. 3, 1991, Pat. No. 5,206,951, which is a continuation of Ser. No. 88,622, Aug. 21, 1987, abandoned.

[51] Int. Cl.<sup>6</sup> ..... G06F 9/40; G06F 17/30

[52] U.S. Cl. .... 395/614; 395/615; 395/683

[58] Field of Search ..... 395/700, 650, 395/600; 364/DIG. 1, DIG. 2, 283.4, 979.4

## [56] References Cited

## U.S. PATENT DOCUMENTS

4,387,427	6/1983	Cox et al.	364/200
4,558,413	12/1985	Schmidt et al.	364/300
4,587,628	5/1986	Archer et al.	364/900
4,815,029	3/1989	Barker et al.	364/900
5,206,951	4/1993	Khoyi et al.	395/650
5,226,161	7/1993	Khoyi et al.	395/650
5,421,012	5/1995	Khoyi et al.	395/650

## OTHER PUBLICATIONS

Lipkie, et al., "Stargraphics: An Object-Oriented Implementation." Computergraphics, v. 16, No. 3, Jul. 1982, pp. 29-38.

Schmucker, "MACAPP: An Application Framework," BYTE, Aug. 1986, pp. 189-193.

Kimura, "A Structure Editor for Abstract Document Objects," IEEE Transactions of Software Engineering, vol. SE-12, No. 3, Mar. 1986, pp. 417-435.

Ursino, "Open Architecture Design Unites Diverse Systems," Electronics, Aug. 11, 1983, pp. 116-117.

Garrett, "Intermedia: Issues, Strategies, and Tactics in the Design of a Hypermedia Document System", Institute for Research in Information and Scholarship (IRIS), Brown University.

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## [57] ABSTRACT

An object based data processing system including an extensible set of object types and a corresponding set of "object managers" wherein each object manager is a program for operating with the data stored in a corresponding type of object. The object managers in general support at least a standard set of operations. Any program can effect performance of these standard operations on objects of any type by making an "invocation" request. In response to an invocation request, object management services (which are available to all object managers) identifies and invokes an object manager that is suitable for performing the requested operation on the specified type of data. A mechanism is provided for linking data from one object into another object. A object catalog includes both information about objects and about links between objects. Data interchange services are provided for communicating data between objects of different types, using a set of standard data interchange formats. A matchmaker facility permits two processes that are to cooperate in a data interchange operation identify each other and to identify data formats they have in common. A facility is provided for managing shared data "resources". Customized versions of resources can be created and co-exist with standard resources. A resource retrieval function determines whether a customized or a standard resource is to be returned in response to each request for a resource.

3 Claims, 8 Drawing Sheets

